

BOLTS USED IN WOOD CONSTRUCTION**Circular 23-1**

Reference: California Building Code, Section 2318A.2

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This circular is intended for use by the DSA plan review engineers and field engineers to indicate an acceptable method for achieving compliance with applicable codes. Its purpose is to promote uniform statewide criteria for use in plan review and construction review of public elementary and secondary schools, community colleges and state-owned or state-leased essential services buildings. Other methods proposed by design professionals to solve a particular problem may be considered by DSA and reviewed for code compliance.

Purpose: The purpose of this circular is to clarify dimensional requirements for bolts used in wood frame construction.

1. General. Cut-thread or rolled-thread bolts with full diameter bodies meeting the requirements of ASME B18.2.1 or ASME B18.2.6 are permitted for use on projects approved by DSA. See Table 1 below for dimensional requirements of cut-thread or rolled-thread bolts with full diameter bodies. Rolled-thread bolts with reduced diameter bodies per ASME B18.2.1 are not permitted.

2. Background. Dimensional requirements for bolts are given in ASME B18.2.1, "Square and Hex Bolts and Screws", and ASME B18.2.6, "Fasteners for Use in Structural Applications." Bolt threads are formed either by cutting or rolling.

2.1 Cut-Thread Bolts. The original blank must be full size, and equal to the major thread (outside) diameter. Threads are formed by cutting and removing metal from the blank. A bolt blank is a headed rod or bar intended for a subsequent threading operation.

2.2 Full Diameter Body Rolled-Thread Bolts. The blank diameter is full size and the threaded length portion is reduced to the thread pitch diameter during extrusion. Threads are formed by rotating dies that displace the metal.

2.3 Reduced Diameter Body Rolled-Thread Bolts. Similar to full diameter body rolled-thread bolts, except that the blank diameter is reduced along the entire length of the bolt.

2.4 Commercially, the terms "cut-thread" and "rolled-thread" may not indicate the method of forming threads. The term "cut-thread bolt" may refer to either a cut-thread bolt or a full diameter body rolled-thread bolt. The term "rolled-thread bolt" may refer to a reduced diameter body rolled-thread bolt.

3. Application. Cut-thread or rolled-thread bolts with full diameter bodies are permitted. For each nominal bolt size utilized on a project, the minimum shank or body diameter shall be specified and ASME B18.2.1 or ASME B18.2.6 shall be referenced on the drawings or specifications.

Table 1 Diameter of Full Diameter Body Bolts

Nominal Size (inches)		Body or Shank Diameter (inches)	
		Max.	Min.
1/2	0.5000	0.515	0.482
5/8	0.6250	0.642	0.605
3/4	0.7500	0.768	0.729
7/8	0.8750	0.895	0.852
1	1.0000	1.022	0.976

Notes: 1) Adopted from ASME B18.2.1 and ASME B18.2.6.

2) For bolt diameters not indicated, refer to ASME B18.2.1 and B18.2.6.

3) The body or shank of a bolt is the smooth portion between the head and the threads.